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# Agile Target Effects Data Management Tool— ATE DMT

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## Agile Target Effects Data Management Tool—ATE DMT

- Developed under Agile Target Effects Systems (ATES) Science and Technology Objective
- Originally a research tool with a narrow application in directed energy
- Relational database running on Microsoft SQL Server
- Links materiel to directed energy (DE) effects database
- Links materiel to fighting tips
- Allows best-guess inferences based on fundamental technology (“All else being equal....”)
- Links targets to “fighting tips”

→ Multi-use tool:

- > Materiel developer
- > Combat developer
- > Battle staff

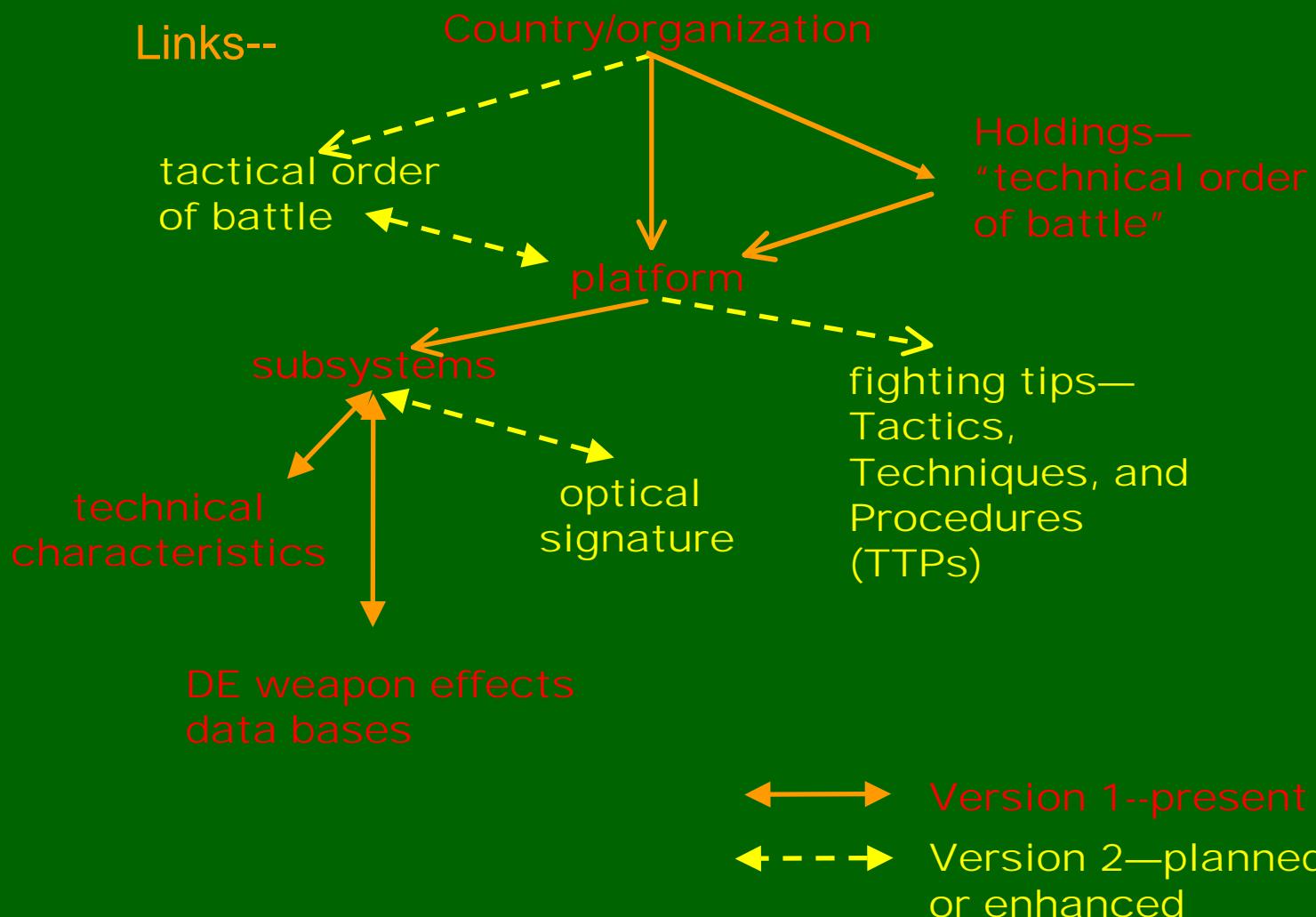


## Agile Target Effects Data Management Tool--continued

- Runs on laptop—planning on the fly
- Web based application or standalone
- Web paradigm allows
  - > central management
  - > central configuration control
  - > *fast* update in response to field emergencies
  - > remote access to current info
- Materiel and combat developers can interrogate effects database
- All users can access updated Tactics, Techniques, and Procedures (TTPs)
- Can be used by battle staff to plan and to respond to unexpected technical situations
- Aid to data fusion
- Not limited to DE effects and data
- Version 1 completed; version 2 will include enhancements such as “fighting tips”
- Fighting tips must be cooperative effort between battle staffs, R&D, combat developers

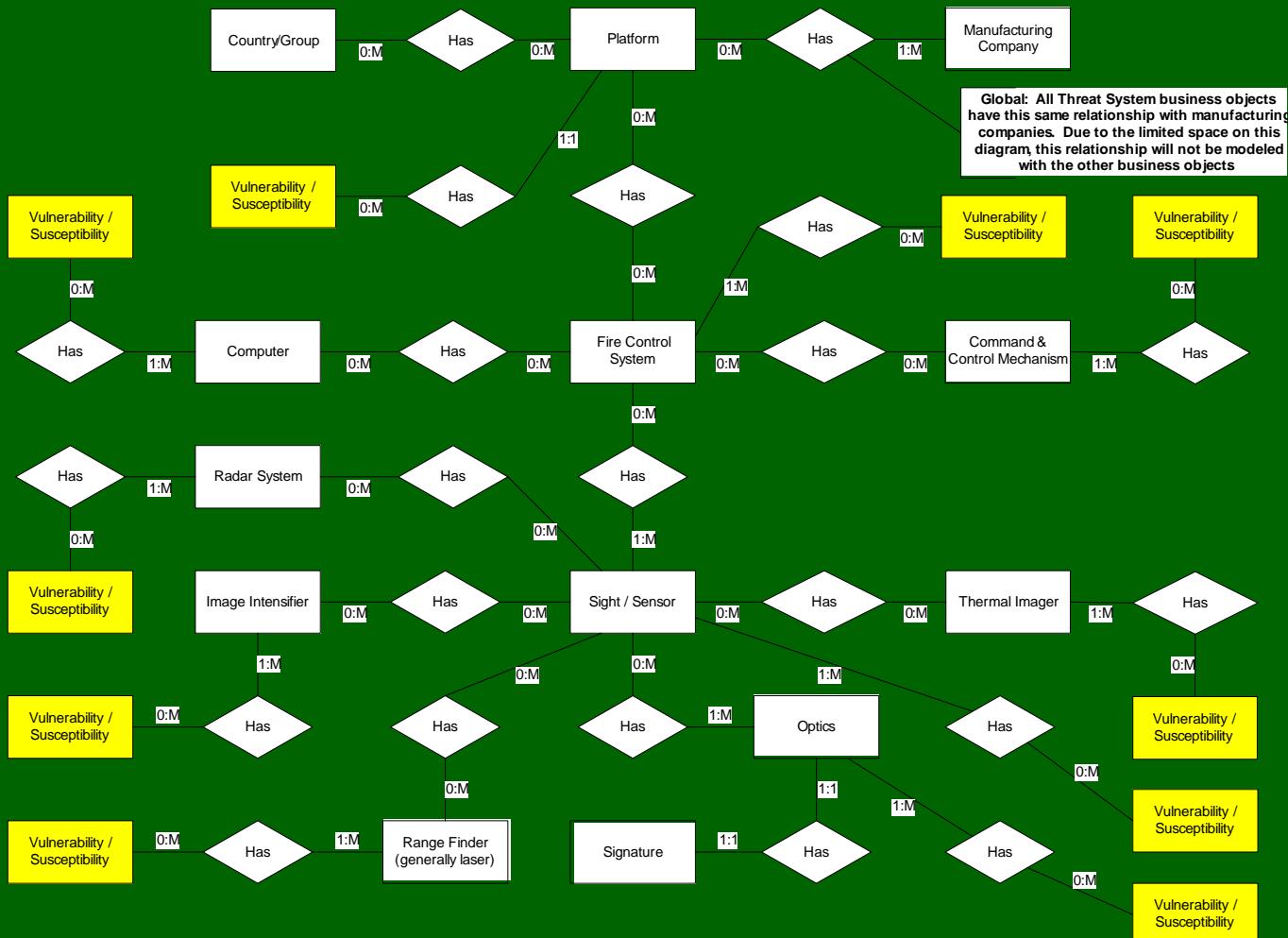


## Basic information links





# Simplified organization, version 1





# Basic point of entry to database

## Agile Target Effects



[References](#) [Threat Systems](#) [Advanced Energy Technologies](#)

Countries / Groups	Platforms
<a href="#">Platforms</a>	<b>Platforms</b>
<a href="#">Fire Control Systems</a>	<b>1999 - USA M1A2 MBT Abrams</b>
<a href="#">Command &amp; Control</a>	This is the latest Abrams tank which is an upgrade of the M1A1 version. The U.S. Army has ordered 1,150 M1A2SEP (S/tems Enhancement Package) to be in service by 2004
<a href="#">Weapons</a>	<a href="#">View Vulnerabilities</a>
<a href="#">Computers</a>	<b>1962 - USA M108 105mm Self-propelled gun</b>
<a href="#">Sights</a>	Sister vehicle, M109, has a 155mm gun on the same chassis replacing the Model 108. It has made the M108 obsolete. Both vehicles are highly mobile to avoid enemy counter fire. The M109 is still in widespread use and was very valuable in the Gulf war
<a href="#">Thermal Imagers</a>	<a href="#">View Vulnerabilities</a>
<a href="#">Optics</a>	<b>Infantry Fighting 1981-USA M2A2 Bradley Vehicle (IFV)</b>
<a href="#">Range Finders</a>	The improved M2A2 is equipped with heavier armor added to the hull sides and bottom increasing the weight, as well as many other changes including improved drive and suspension.
<a href="#">Radar Systems</a>	<a href="#">View Vulnerabilities</a>
<a href="#">Image Intensifiers</a>	<b>1978 - USA M60A3 Main Battle Tank</b>
<a href="#">Manufacturing Companies</a>	Final production model of the M60 series. Has stabilization system for main armament, a more reliable power pack and a fire control computer and laser rangefinder for greater first-round hit probability. Israel continues to carry out improvements to the M60 series.
<a href="#">Add New Platform</a>	<a href="#">View Vulnerabilities</a>

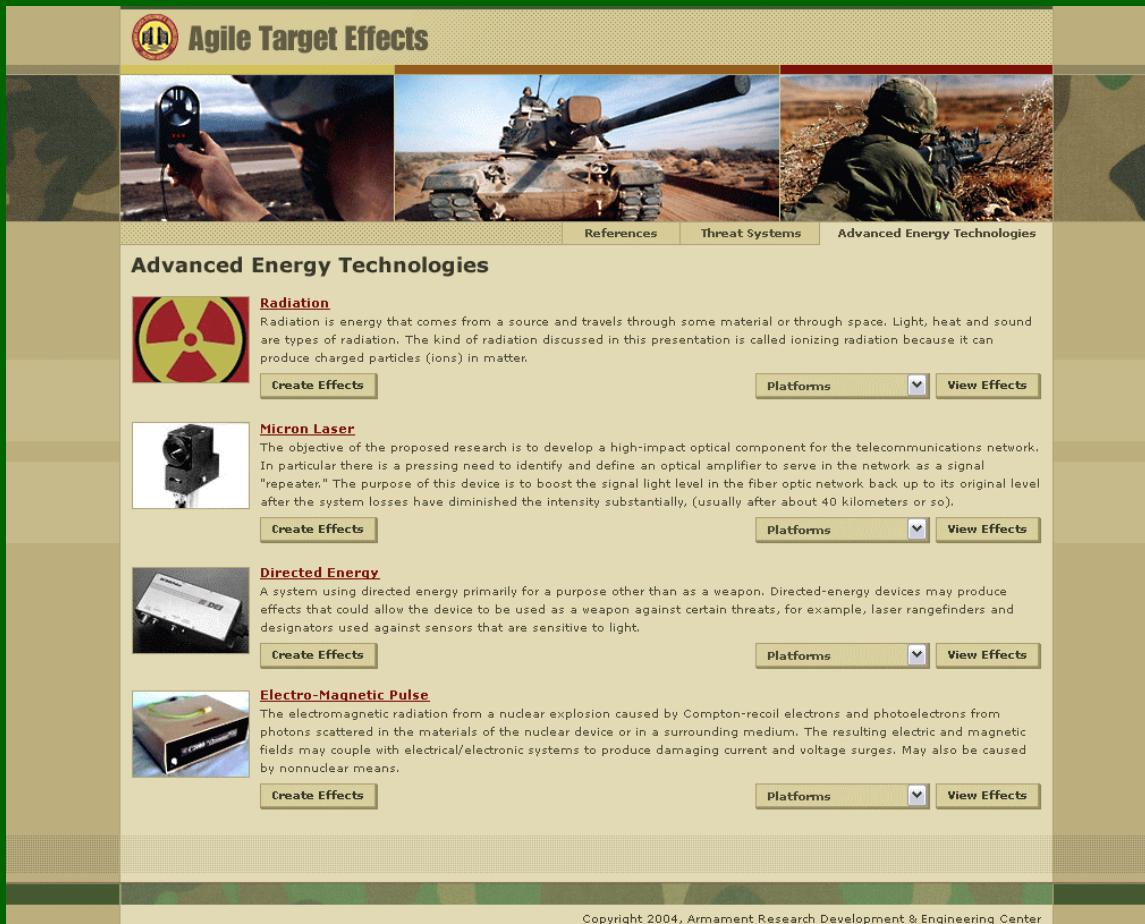
Copyright 2004, Armament Research Development & Engineering Center



## Can be used to assess impact of technologies

Advanced energy technology → platform or specific effects on that platform—not limited to DE

**Agile Target Effects**



**Advanced Energy Technologies**

**Radiation**  
Radiation is energy that comes from a source and travels through some material or through space. Light, heat and sound are types of radiation. The kind of radiation discussed in this presentation is called ionizing radiation because it can produce charged particles (ions) in matter.

**Micron Laser**  
The objective of the proposed research is to develop a high-impact optical component for the telecommunications network. In particular there is a pressing need to identify and define an optical amplifier to serve in the network as a signal "repeater." The purpose of this device is to boost the signal light level in the fiber optic network back up to its original level after the system losses have diminished the intensity substantially, (usually after about 40 kilometers or so).

**Directed Energy**  
A system using directed energy primarily for a purpose other than as a weapon. Directed-energy devices may produce effects that could allow the device to be used as a weapon against certain threats, for example, laser rangefinders and designators used against sensors that are sensitive to light.

**Electro-Magnetic Pulse**  
The electromagnetic radiation from a nuclear explosion caused by Compton-recoil electrons and photoelectrons from photons scattered in the materials of the nuclear device or in a surrounding medium. The resulting electric and magnetic fields may couple with electrical/electronic systems to produce damaging current and voltage surges. May also be caused by nonnuclear means.

References   Threat Systems   Advanced Energy Technologies

Create Effects   Platforms   View Effects

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## Can be used to investigate platform configurations

platform → detailed technical info on that platform (*not limited to fire control, electronics, etc.*)

**Platforms Configuration**

**Name:** AMX-10P

**Description:** AMX-10P Infantry Light Armored Vehicle

**Classification:**  Classified  Unclassified

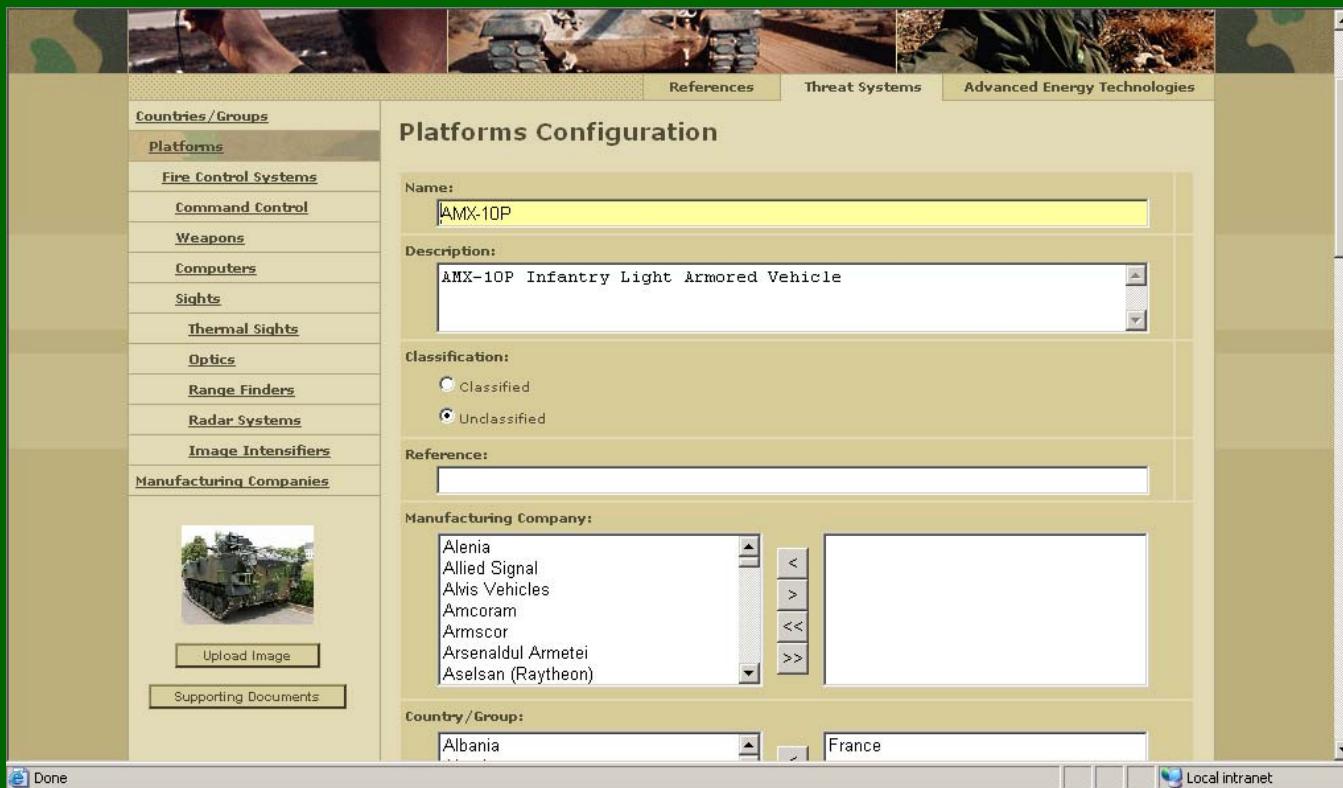
**Reference:**

**Manufacturing Company:**

Alenia  
Allied Signal  
Alvis Vehicles  
Amcoram  
Armscor  
Arsenalul Armetei  
Aselsan (Raytheon)

**Country / Group:** Albania France

**Done** **Local intranet**





Can be used to investigate technical aspects of opposition—planning on the fly

Country → platform → detailed technical info on that platform (*not limited to fire control, electronics, etc.*), and how to exploit or counter them

tblPlatform data management

User's platform data management tool

platform name	M1A1	laser based CM	unknown	add/ch LCM				
select platform	M1A1	non-laser CM	smoke grenade	add/ch CM				
sel. basic vehicle	M1	select classification	UNCLASSIFIED	platform level effects				
manufacturing company	General Dynamics Land	classified by	NA	fighting tips				
modifying company	unknown	declassify on	NA	FCS				
using service 1	Army	references	countermeasure system is smoke grenade system L8A1, M250 ( <a href="http://www.prado.com/armosrite/abrams.htm">http://www.prado.com/armosrite/abrams.htm</a> ) Also has engine generated smoke.					
using service 2	Marine	add/change service	inventory by country					
laser source	unknown	countermeasures	sights					
laser warning receiver		tblAssocFightingTips Platform subform						
		select fighting tips	countering anti-thermal night sight					
			Ordinary oil based, white phosphorus, or combustion based smoke such as smoke resulting from grass fires does not greatly affect the wavelengths used by either thermal night sights or beams used to jam thermal night sights. Enough will, but the smoke density required from those sources is quite high. Dust from high explosive shell will attenuate those wavelengths considerably; enough dust will attenuate the beam or obscure the scene quite a lot.					
ballistic computer		tblAssocPlatform_Sight user version subform						
tactical/SA/BM co		tblAssocPlatform_Sight user version subform						
Record:	210	sight/subsystem name	M939 Gunner's Auxiliary	select sight/subsystem	M939 Gunner's Auxiliary Sight	refresh	sight level effects	
		sight ID	sight name	detector	spectrum	las hard?	lo-sig reticle?	sight level signatures
1	unknown	unknown	unknown	No	No	No	No	
201	generic coaxial telescope	unknown	unknown	No	No	No	No	
210	M939 Gunner's Auxiliary Sight			No	No	No	No	
211	GPS			No	No	No	No	
sight ID	dev. company	dev. country	detector	I2 tech.	TNS tech	add/change sights	add/change effects	
204	unknown	unknown	unknown	unknown	unknown			
207	Pilkington	UK	HgCT	unknown	unspecified MC			
210	Kollmorgen	USA		unknown	none			
211	Raytheon	USA	NA	unknown	none			
Record:	1	1	1	1	1	1	1	

(to be added in version 2; Access forms shown here to illustrate functionality)



Can be used to investigate technical aspects of opposition—  
planning on the fly

Platform → fighting tips, triggered by situation encountered

tblPlatformFightingTipsSelection

platform (modified vehicle) name	M1A1	Platform ID	114	
select platform	M1A1	Refresh		
tblAssocFightingTips_Platform subform1				
fighting tips selection	countering anti-thermal night sight lasers-glare		Refresh	
platform vs fighting tips	FightingTipsID	6	Platform ID	114
114 M1A1 4	defeat of laser homing missiles			
116 M1A1D 4	defeat of laser homing missiles			
117 M1A2 SEP 4	defeat of laser homing missiles			
113 M1 6	countering anti-thermal night sight lasers-glare			
114 M1A1 6	countering anti-thermal night sight lasers-glare			
115 M1A2 6	countering anti-thermal night sight lasers-glare			
117 M1A2 SEP 6	countering anti-thermal night sight lasers-glare			
tblFightingTips subform				
title/subject	countering anti-thermal night sight lasers-glare		Refresh	
classification	UNCLASSIFIED	declassify on	NA	
tips	FightingTipsID	6	classified by	NA
Some lasers—notably CO <sub>2</sub> —are in-band to most thermal night sights. They may lase at many wavelengths within this band, most commonly 10.6 micrometers. A thermal night sight whose aperture is flooded with light in this band may be damaged or washed out. Damage can be: catastrophic—the night sight ceases to work; minor—the sight has elements destroyed, producing dark or white lines in the display, depending on whether the sight is set to white-hot or black-hot; or the sight can be jammed—the scene is washed out or obliterated. If a laser does damage the night sight has the “ulse Filter” touch to a setting that removes				
source				
references				
Record:	1	2	3	4
Record:	3	4	5	6
Record:	49	50	51	105

(to be added in version 2; Access forms shown here to illustrate functionality)



Can be used to investigate technical aspects of opposition—  
planning on the fly

## Platform → fighting tips

Example scenario—

Expeditionary force Task Force Smythe air landed in distant island to bolster indigenous forces against expected air and sea assault

Helicopter gunner reports dazzling green flash just before pilot loses control and crashes

Light armored vehicle commanders report enemy vehicles appear to be Chinese type 98 tanks

Infantry units report dazzling lines of light targeted on missile crews, but missile crews using thermal sights engage successfully

S-2 interrogates ATE DMT terminal on type 98—data base responds that some type 98s were reported on the internet with a directed energy search/blinder countermeasure set  
(<http://www.sinodefence.com/army/tank/type98.asp>, accessed 17 May 2005)

Fighting tip—TTP—corresponding advises engagement with thermal sights, luring enemy engagement with dummy I2 sights to make enemy disclose position, then engage with thermal night sights and conventional rounds or Javelin

S-2 passes info to units

Units report success in destroying enemy tank unit



# Summary

## The ATE DMT

- Has the potential for drastically reducing the time for an analyst to devise an evaluation plan
- Can substantially aid an analyst or designer in picking through the technological options available
- Has the potential to aid an expeditionary battle staff in countering unexpected technologically sophisticated enemy systems
- Can help battle staff and commanders use their systems to gain the most advantage



# Backups



## Simplified interface

tblPlatform data management

### User's platform data management tool

platform name: M1A1

select platform: M1A1

sel. basic vehicle: M1

manufacturing company: General Dynamics Land

modifying company: unknown

using service 1: Army

using service 2: Marine

laser source: unknown

laser warning receiver:

ballistic computer:

tactical/SA/BM co:

Record: < < < < < <

laser based CM: unknown

non-laser CM: smoke grenade

add/ch LCM: add/ch CM

select classification: UNCLASSIFIED

classified by: NA

declassify on: NA

114

platform level effects

fighting tips

FCS

inventory by country

sights

references

countermeasure system is smoke grenade system L8A1, M250 (<http://www.fprado.com/armorsite/abrams.htm>) Also has engine generated smoke.

tbAssocFightingTips\_Platform subform1

select fighting tips: countering anti-thermal night sight

radio 1: unknown

radio 2: unknown

Ordinary oil based, white phosphorus, or combustion based smoke such as smoke resulting from grass fires does not greatly affect the wavelengths used by either thermal night sights or beams used to jam thermal night sights. Enough will, but the smoke density required from those sources is quite high. Dust from high explosive shell will attenuate those wavelengths somewhat; enough dust will attenuate the beam or obscure the scene quite a lot.

tblAssocPlatform\_Sight user version subform

sight/subsystem name: M939 Gunner's Auxiliary

select sight/subsystem: M939 Gunner's Auxiliary Sight

Record: < < < < < <

sight ID	sight name	detector	spectrum	las hard?	lo-sig reticle?
1	unknown	unknown	No	No	
201	generic coaxial telescope	unknown	No	No	
210	M939 Gunner's Auxiliary Sight		No	No	
3	GPS		No	No	

sight ID	dev. company	dev. country	detector	I2 tech.	TNS tech
204	unknown	unknown		unknown	unknown
207	Pilkington	UK	HgCT	unknown	unspecified MC
210	Kollmorgen	USA		unknown	none
211	Raytheon	USA	NA	unknown	none

Record: < < < < < < 1 > > > \* of 4 (Filtered)

refresh

sight level effects

sight level signatures

add/change sights

add/change effects



# Materiel developer tool—sighting subsystems

Sight/subsystem management tool

Name: M938 Commander's Weapon Sight Station select sight/subsystem: M938 Commander's Weapon Sight Station

refresh data Close

select sight type Accuracy II WFOV 1 TNS WFOV

classification unknown Data Output format II NFOV 2 TNS NFOV

classified by NA Spectrum II magnification 1 TNS magnification 1

declass. on NA Gain II magnification 2 TNS magnification 2

212 Users TNST ID 37 TNS transmission 1

tblAssocSight\_Developing Company subform

devel. company: Kollmorgen change

select company: Kollmorgen Refresh

Record: 1 2 3 4 5 6 7 8 9 10 of 1

tblAssocSight\_Developing Country subform

devel. country: USA change

select country: USA refresh

Record: 1 2 3 4 5 6 7 8 9 10 of 1

Application: tank commander uses this to aim .50 MG

Description: fixed power monocular periscope

Notes: MoreInfo  References: [http://www.eo.kollmorgen.com/product\\_spec28.html](http://www.eo.kollmorgen.com/product_spec28.html)

array: NA

tblAssocSight\_Signature subform

notional optical signature 2-NIR select associated signature: notional optical signature 2-NIR

signature name: notional optical signature 2-NIR link to data: \\\signature data\Notional optical signature 2 blank

select signature:

classification: UNCLASSIFIED spectrum: near IR (7)

classified by: declass. comments: references: freq. range: 10 opt./ther. cont: opt. Xsect./lambda B m2/sr@ radar Xsection/freq

description: notional optical signature 2-NIR

Record: 1 2 3 4 5 6 7 8 9 10 of 1

tblAssocSights\_Effects subform1

effect name: notional visible anti-optic thingie classification:

select effect: notional visible anti-optic thingie classified by:

relevance: 2 comments:

effect name: notional visible anti-optic thingie comments:

spectrum: visible classification: UNCLASSIFIED

effects type: unknown classified by: NA declassify on: NA reference:

link to data:

Record: 1 2 3 4 5 6 7 8 9 10 of 1

tblqryAssocSights\_OpticalThreat

Threat name: surrogate 1 classification: UNCLASSIFIED

select threat: 1 classified by: NA

links to data: declassify on: NA

Record: 1 2 3 4 5 6 7 8 9 10 of 2

tblAssocSights\_Artillery Guided Munitions subform

GAM name: none  Refresh

select guided art. mun: none  add/change GAM

Record: 1 2 3 4 5 6 7 8 9 10 of 1

tblAssocSights\_ATM subform

ATM: none  add/change ATM

select ATM: none  Refresh

Record: 1 2 3 4 5 6 7 8 9 10 of 1

Record: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 of 157



## Signature search tool

Signature search tool

signature name: notional optical signature 2-NIR

spectrum: near IR (.7-1.4 μm)

10

select signature: notional optical signature 2-NIR

description: notional optical signature 2-NIR

frequency range: B m2/sr@900nm

optical cross section/wave: comments: (empty)

radar cross section/freq: (empty)

optical/thermal contrast: (empty)

classification: UNCLASSIFIED

classified by: (empty)

declassify on: (empty)

refresh

list of possible platforms

signature ID	spectrum ID	signature name	sight name	platform name	holdings est. 1	holdings est. 2	nation
10	8	notional optical signature 2-NIR	AN/VVS-2	M1	218		Kuwait
10	8	notional optical signature 2-NIR	M939 Gunner's Aux	M1A1	4393		USA
10	8	notional optical signature 2-NIR	M938 Commander's	M1A1	4393		USA
10	8	notional optical signature 2-NIR	AN/VVS-2	M1A1	4393		USA
10	8	notional optical signature 2-NIR	AN/VVS-2	M1A2	586		USA
10	8	notional optical signature 2-NIR	M938 Commander's	M1A2	586		USA
10	8	notional optical signature 2-NIR	M939 Gunner's Aux	M1A2	586		USA
10	8	notional optical signature 2-NIR	GPS-2nd Gen	M1A2	586		USA
10	8	notional optical signature 2-NIR	M939 Gunner's Aux	M1A2 SEP	588		USA
10	8	notional optical signature 2-NIR	GPS-2nd Gen	M1A2 SEP	588		USA
10	8	notional optical signature 2-NIR	AN/VVS-2	M1A2 SEP	588		USA
10	8	notional optical signature 2-NIR	M938 Commander's	M1A2 SEP	588		USA
10	8	notional optical signature 2-NIR	1 meter coincidenc	M-47	8	0	Bosnia-Herzegovina
10	8	notional optical signature 2-NIR	1 meter coincidenc	M-47	78		Jordan

Record: 7 of 12